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EXAMINER	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/551,339
Filing Date: September 14, 2006
Appellant(s): MANETTAS ET AL.

Andrew Pallapies, Attorney
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 7/16/2010 appealing from the Office action mailed 3/15/2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

Comment [F1]: Need to use the update version of the Examiner Answer in OACs which has more info that this for secton 6.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

3,839,878	TILMANIS	10-1974

3,726,104	HOWLAND	4-1973
3,716,096	BERRETT ET AL	2-1973
4,736,594	PAO	4-1988
3,248,894	HARBOUR	3-1966

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 11, 15-18, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Tilmanis (US Patent No. 3,839,878).

Regarding claims 11, 15, and 16, Tilmanis discloses a refrigeration device, comprising a thermally insulating housing (10, see column 3 line 53, see also figure 1) enclosing an inner chamber (14, see column 3 lines 54-55) and an evaporator arranged in said housing (18, see column 3 lines 59-60) separated from the inner chamber, the evaporator being in an air passage separated from and communicating with the inner chamber, as without the air passage the inner chamber would not be cooled by the evaporator; a pair of temperature sensors (36, 38, see column 4 line 10) placed in the vicinity of the evaporator such that for a given thickness of the ice layer only one of the temperature sensors is embedded in the ice layer (see column 4 lines 17-19), the

temperature sensors constituting a measuring device arranged in the air passage to provide a measured signal representative of the air flow through the air passage; a heating device for heating the evaporator (see column 3 lines 63-65); and a monitoring and control circuit connected to the pair of temperature sensors (see column 4 lines 30-41) which determines the difference between the temperature values detected by the pair of temperature sensors and activates the heating device when the temperature difference exceeds a predetermined value (see column 4 lines 42-47).

Regarding claims 17-18, the refrigeration device of Tilmanis further has a first sensor arranged directly on the surface of the evaporator (36, see column 4 lines 17-18).

Regarding claim 20, Tilmanis discloses a refrigeration device, comprising a thermally insulating housing (10, see column 3 line 53, see also figure 1) enclosing an inner chamber (14, see column 3 lines 54-55) and an evaporator arranged in said housing (18, see column 3 lines 59-60) separated from the inner chamber, the evaporator being in an air passage separated from and communicating with the inner chamber, as without the air passage the inner chamber would not be cooled by the evaporator; a heating device for heating the evaporator (see column 3 lines 63-65); and a monitoring and control circuit (see column 4 lines 30-41) which estimates an air flow through the air passage in which the evaporator is arranged by determining the difference between the temperature values detected by a pair of temperature sensors (36, 38, see column 4 line 10) and triggers a defrosting process by activating the heating device when the temperature difference exceeds a predetermined value (see

column 4 lines 42-47), which is when the estimated air flow falls below a predetermined threshold value.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 12 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tilmanis (US Patent No. 3,839,878) in view of Howland (US Patent No. 3,726,104).

Regarding claim 12, it is noted that Tilmanis does not disclose the measuring device to include a body directly driven to move by said air flow in said passage and a sensor to record the movement of said body indicative of air flow speed and said control circuit to determine a fall below said threshold value when air flow speed falls below said threshold value. Howland explicitly discloses the use of a body (15, see column 3 lines 43-51), which is a wind wheel, driven to move by the air flow in the passage from the evaporator to the cooled space (see figure 1), and a sensor which records the movement of the body indicative of the air flow speed and the control circuit to determine a fall below said threshold value when the recorded air flow speed falls below the threshold value (see column 3 lines 55-60), as an increase in the speed past impeller 15 will be a consequence of a decrease in air flow past the evaporator. As the systems of Tilmanis and Howland are both concerned with the proper timing of defrost operation in refrigeration systems, it would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the impeller of Howland for the temperature sensors of Tilmanis in order to provide an equivalent control of the defrost of the system for which it is easier to detect damage to the air flow sensor, as it is easier to detect a broken impeller than a broken temperature sensor.

7. Claims 13, 21, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tilmanis (US Patent No. 3,839,878) in view of Howland (US Patent No. 3,726,104) and Berrett et al (US Patent No. 3,716,096).

Regarding claims 13, 21, and 23, it is noted that Tilmanis does not disclose the measuring device to include a directly displaceable elastic element which can be deflected from a rest position by said air flow in said passage and a sensor to record the deflection of said element indicative of air flow speed and said control circuit determines a fall below said threshold value when the recorded deflection falls below said threshold value. Howland explicitly discloses the use of air flow to determine defrost (15, see column 3 lines 43-51). Berrett et al explicitly discloses the use of an elastic element which can be deflected from a rest position by air flow in a passage, combined with a position sensor and control circuit, to help control an air conditioning system for a building (32, 44, see figures 1 and 2; see also column 2 lines 64-67). It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to use the flow sensor of Berrett et al in the system of Tilmanis as taught by Howland to control defrost in a way that has less delicate electronic parts to break and is therefore is more reliable.

8. Claims 14 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tilmanis (US Patent No. 3,839,878) in view of Pao (US Patent No. 4,736,594).

Regarding claims 14 and 24, it is noted that Tilmanis does not disclose the measuring device to include a pressure sensor to measure a dynamic air pressure in said passage indicative of air flow speed and said control circuit to determine a fall below the threshold value when said recorded pressure rises above said threshold value. Pao explicitly discloses the use of a pressure sensor (18, see column 5 lines 10-13) to determine air flow across the evaporator coil; indeed, when the air flow is

sufficiently low, this will be detected as a high pressure drop, and will initiate defrost. As the systems of Pao and Tilmanis are both concerned with defrost control, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the pressure sensor of Pao in the system of Tilmanis for defrost control in place of the second temperature sensor of Tilmanis in order to have redundant data and error-checking in place in the system of Tilmanis. Additionally, the pressure sensor of the system of Tilmanis in view of Pao is directly displaced by the airflow, as the pressure sensor works by detection of an amount of displacement.

9. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tilmanis (US Patent No. 3,839,878) in view of Harbour (US Patent No. 3,248,894).

Regarding claim 19, it is noted that Tilmanis does not explicitly disclose the second temperature sensor to be arranged on an output of said passage. Harbour explicitly discloses the use of two temperature sensors to control defrost, with one being on the evaporator and the other being near the outlet of the evaporator air passage (66, 59, see column 3 lines 74-75 and column 4 lines 1-9). As the systems of Tilmanis and Harbour are highly similar in structure and function, it would have been obvious to one of ordinary skill in the art at the time of the invention to put the second temperature sensor of Tilmanis at the outlet of the evaporator passage, as is done by Harbour, in order to prevent false readings caused by close proximity to frozen objects.

(10) Response to Argument

Applicant's arguments filed 5/21/2010 have been fully considered but they are not persuasive. The reasons are as follows:

Regarding the rejection of claim 22 under 35 USC 112, second paragraph, this rejection is withdrawn.

The examiner can only apologize for any confusion caused by the error comprised in the accidental inclusion of the comment in the margin in the action which was sent; such editorial comments are part of the internal review process, and are normally deleted.

Additionally, the applicant may wish to note that in dependent claims 12 and 21, when the measurement device is actually claimed to be driven by air flow and that the movement be indicative of air flow, a secondary reference (Howland) was used, which actually does measure air flow itself.

Regarding the rejection of claims 11, 15-18, and 20 as anticipated by Tilmanis, the rejection is maintained.

It is argued on page 8 of the Appeal Brief that the temperature sensors of Tilmanis do not constitute a measuring device arranged in the air passage to provide a measured signal representative of the air flow through the air passage.

The examiner concedes that the temperature sensors of Tilmanis do not, alone, constitute a measurement of air flow itself. However, this is not what is claimed. What is claimed is a measuring device which provides "a measured signal *representative* of air flow through the air passage" (emphasis added). The measurement device of Tilmanis need not actually measure air flow itself in order to provide a signal representative of airflow.

Further, the examiner brings forth as evidence of the correlation between air flow and the temperatures sensed two items: the first is this application. If there were no such correlation between temperatures and air flow, the applicant's device would not work to determine when defrosting was required. The second is the basic equation for heat transfer,

$$q = m_{dot}\Delta T$$

where q is the amount of heat transferred, m_{dot} is the mass flow rate, and ΔT is the change in temperature over time. (See Thermodynamics, an Engineering approach, or any other sophomore-level thermodynamics textbook).

The reason evaporators get defrosted is so that they can continue to cause a change in the temperature of the air flowing past them. When there is frost built up, it reduces the mass flow rate of air available to go past, which in turn reduces the available heat transfer possible. This means the system is spending the same amount of energy for less cooling effect.

If less heat is transferred from the air to the evaporator, while the evaporator is at or below freezing because that caused the buildup of ice in the first place, the air blown into the refrigerator will be less cold. This means the temperature difference between the evaporator surface and a temperature in the freezer will be greater. Although this relationship is not necessarily linear, it does inherently exist, causing the sensors to produce a measurement *representative of*, in the sense that it can be mathematically correlated to, the rate of air flow.

It is further argued on page 8 of the appeal brief that the measuring device of Tilmanis is not arranged in said air passage. As previously stated, "in" is not considered to be equivalent to "completely in", and one of the sensors of Tilmanis is clearly in the air passage.

It is also argued on page 9 of the appeal brief that the thermistors of Tilmanis do not meet the requirements of claim 15. One sensor is on the evaporator. The other sensor is in the refrigerator chamber. As the broadest reasonable interpretation of "differently closely coupled" merely requires the sensors be different distances from the evaporator, the presence of one sensor on the evaporator and the other in the refrigerator chamber clearly constitutes the sensors being differently closely coupled to the heat sink that the evaporator is, causing this argument to also be unpersuasive.

On page 9, essentially the same argument is repeated concerning independent claim 20 as was offered for independent claim 11; again, the temperature difference of Tilmanis is *representative of* the air flow through said passage. The actual language of the claim does not require the air flow be measured, but that a measurement representative of the air flow be made. Further, it is respectfully suggested that it is required that as part of making the broadest reasonable interpretation of the claims, the examiner is required not to read limitations of the specification into the claims.

It is further argued on page 9 of the appeal brief that the step of estimating is a physical step which Tilmanis does not perform. The examiner respectfully disagrees with this application of the word "physical." The act of estimating is inherently a method step; this alone renders the argument unpersuasive. Additionally, the correlation

between air flow and temperature difference causes the calculation of the temperature difference to comprise the estimation of the air flow.

It is argued on page 10 of the appeal brief that the impeller 15 of Howland does not record the movement "indicative of air flow speed;" that it simply drives a "clock timer gear train, which after a certain number of rotations by the impeller activates a defrost initiation signal switch 17."

The examiner can only respectfully reply that the air flow is what causes the rotation of the clock drive gear train. This rotation is, indeed, connected to a gear train; but that gear train is connected to the defrost initiation signal 17 (see column 3 lines 3-5). Further, the purpose of the air flow detector of Howland is to detect reduced air flow caused by frost build up and thereby trigger defrosting (see column 3 lines 22-31; "as the evaporator coil 10 becomes plugged with frost, the air flow through the coil 10 is reduced, thus increasing the flow of air past the impeller 15.. ..to cause the switch 17 to be operated sooner than it would be if no frost had accumulated on the evaporator coil 10). Similarly, claim 21 is not allowable; additionally, the measuring device of Howland is clearly disposed in said air passage, as can be seen from the above rejection.

Regarding claims 13 and 21, it is argued on page 10 of the appeal brief that the Berrett patent "merely" describes a flow sensor responsive to air flow through an air duct to close a switch when a predetermined air flow.

As this is all that is required for the simple substitution in the rejection, this argument fails to be persuasive. An indication of whether air flow speed is above or below a given quantity is still an indication of air flow speed.

It is further argued that Berrett fails to disclose an elastic element. As the "sail" portion of the sail switch of Berrett would no longer trigger the switch at the same airspeed if it were not an elastic element, this argument is also unpersuasive.

It is further argued on page 11 that neither Howland nor Berrett provides a suitable teaching that would lead those of ordinary skill in the art to modify the Tilmanis structure to put the air flow sensor in the air flow passage. First, as explicitly explained above and in the previous rejection, "in the air flow passage" and "completely in the air flow passage" are not identical requirements. Second, both Howland and Berrett explicitly disclose air flow sensors; when substituting these for the temperature sensors of Tilmanis, it would render the combined product useless to not locate the sensors in the air flow passage, because then they would not measure the air flow they are present for the purpose of measuring.

Regarding claim 14, it is argued on page 11 that sensing a drop in pressure falls short of measuring a dynamic air pressure indicative of air flow speed.

First, a physical correlation which is present remains present regardless of the explicit statement in a reference of its use or the lack thereof; this means that if the combined structure will have the claimed effect, and has valid reasons to combine, it remains a valid rejection regardless of whether the individual pieces were explicitly taught to be used for the exact same purpose as the applicant. Indeed, requiring the same reasoning as the applicant would require impermissible hindsight when applying a KSR-based reason to combine, as KSR does not require an explicit reason be present in the art itself provided there is a valid reason.

Second, sensing a drop in pressure does constitute measuring a dynamic air pressure. "A drop" means it is the change that is being sensed; this is dynamic. Further, "indicative of" does not require an explicit, precise correlation on an analog scale; it requires an indication. An on/off or fast/slow indicator still generates an indication, whatever degree of precision it may lack.

Regarding claim 24, it is not allowable for the reasons given above regarding claim 14.

Regarding claim 19, it is argued on page 12 that the modification proposed in the rejection directly contrasts an objective of the Tilmanis patent, and therefore the rejection is misplaced and improper hindsight.

It is true that Tilmanis explicitly discloses the invention to comprise a method and apparatus for continuously or periodically sensing the temperature of, or closely adjacent to, the evaporator coil and the temperature of a storage space of the refrigerator, and automatically initiating defrost operation when the temperature difference exceeds a predetermined value (see column 1 lines 57-66 and column 2 lines 11-21). This is not the same as the object of the invention including the presence of a temperature sensor in the food storage compartment. Indeed, Tilmanis also explicitly discloses that the "temperature sensing means for the storage space may be located in *or near* the freezing chamber or the refrigerated chamber thereof" (column 2, lines 1-4 of Tilmanis; emphasis added.) As Tilmanis explicitly discloses that the temperature sensing means need not actually be in the storage space, the movement of that

temperature sensor out of the storage space cannot reasonably be considered to destroy the reference. Therefore, this rejection is maintained.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/AKC/

8/20/2010

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